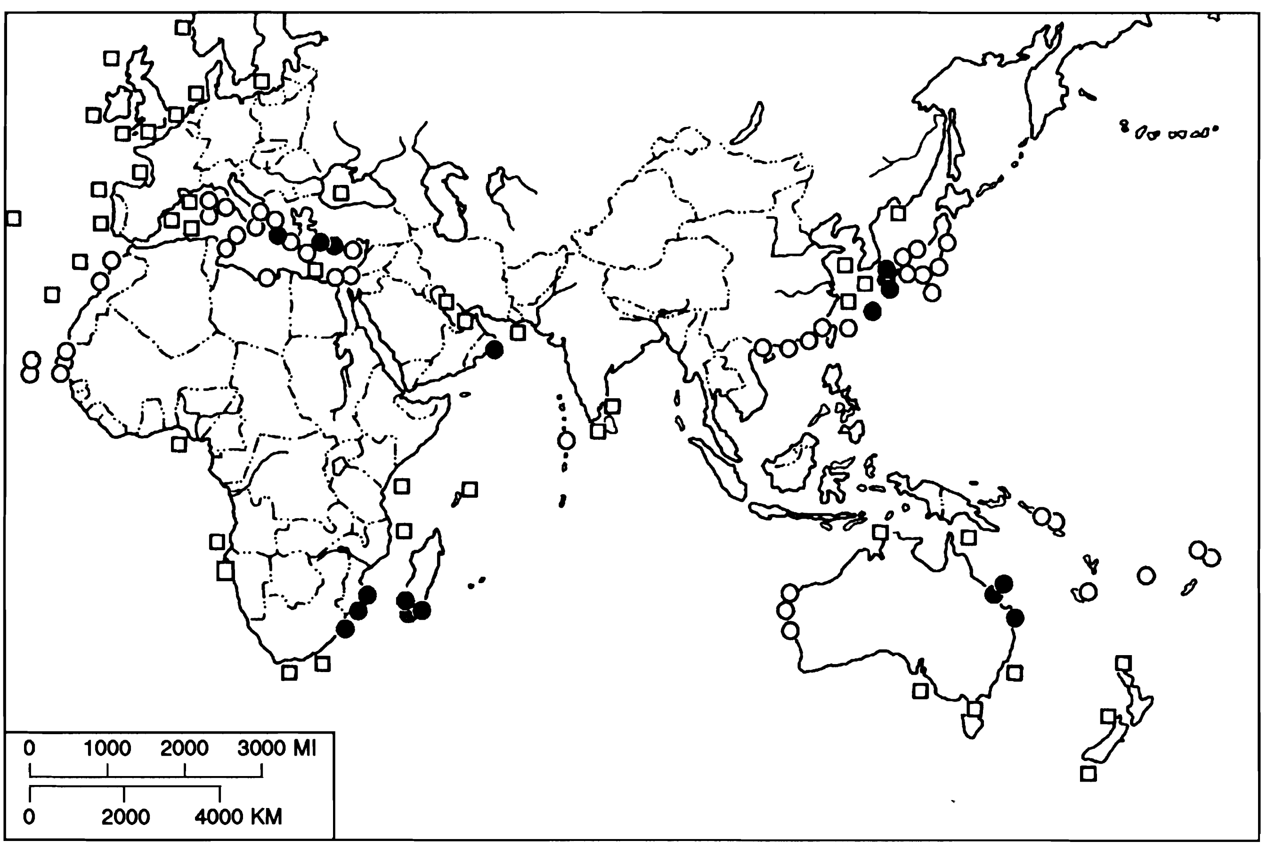
Catalogue of American Amphibians and Reptiles.

Dodd, C. Kenneth Jr. 1990. *Caretta caretta.*

Caretta caretta (Linnaeus)
Loggerhead Sea Turtle

Testudo Caretta Linnaeus, 1758:197. Type-locality, "insulas Americanas," restricted to "Bermuda Islands" by Smith and Taylor (1950:16) and to "Bimini, British Bahamas" by Schmidt (1953: 107). Holotype, not designated although the three suspected types for Linnaeus' (1758) *Testudo mydas* are carapaces of *C. caretta* (Wallin, 1985).
Testudo Cephalo Schneider, 1783:303. Type-locality, unknown, restricted to "Charleston, S[outh] C[arolina]" by Smith and Taylor (1950:16). Holotype, not designated.
Testudo nasicornis Lacépède, 1788:103. Type-locality, "mers du nouveau Continent, voisines de l'equateur," restricted to "Ascension Island" by Smith and Smith (1980:302). Holotype, not designated. See remarks.
Testudo Caouana: Lacépède, 1788:103. Substitute name for *Testudo caretta* Linnaeus, 1758. See remarks.
Chelone caretta: Brongniart, 1805:27.
Chelonia Caouanna: Schweigger, 1812:279. *Ex errore.*
Caretta nasuta Rafinesque, 1814:66. Type-locality, "sicil" [Sicily]. Holotype, not designated.
Chelonia cavanna: Oken, 1816:350. *Ex errore.*
Caretta atra Merrem, 1820:17. Type-locality, "Insel Ascension." Holotype, not designated.
Caretta Cephalo: Merrem, 1820:18.
Caretta nasicornis: Merrem, 1820:18.
Chelonia caretta: Bory de Saint-Vincent, 1828:79.
Chelonia cephalo: Gray, 1829:201.
Testudo Corianna: Gray, 1831:53. *Ex errore.*
Chelonia pelasgorum Valenciennes, *in* Bibron and Bory de Saint-Vincent, *in* Bory de Saint-Vincent, 1833:plate 6. Type-locality, "sur la plage sablonneuse entre Arcadia et l'embouchure de la Neda," Greece. Holotype, not designated.
Chelonia (Caretta) cephalo: Lesson, *in* Belanger, 1834:300.
Chelonia caouana: Dumeril and Bibron, 1835:553.
Chelonia (Thalassochelys) Caouana: Fitzinger, 1836 (1835):128.
Chelonia (Thalassochelys) atra: Fitzinger, 1836 (1835):128.
Thalassochelys caretta: Bonaparte, 1838:64.
Chelonia (Caouana) cephalo: Cocteau, *in* Cocteau and Bibron *in* Sagra, 1838:31.
Halichelys atra: Fitzinger, 1843:30.
Caouana Caretta: Gray, 1844:52.
Caouana elongata Gray, 1844:53. Type-locality, unknown, restricted to "Ascension Island" by Smith and Smith (1980:303). Holotype, British Museum (Natural History) 1947.3.5.41, adult shell (not examined by author).
Thalassochelys Caouana: Agassiz, 1857:384.
Thalassochelys corticata Girard, 1858:431. Type-locality, "Madeira," Canary Islands. Holotype, U. S. National Museum 7778, dry juvenile, collected in 1838 (not examined by author).
Chelonia corticata: Strauch, 1862:19.
Thalassochelys elongata: Strauch, 1862:63.
Thalassiochelis caouana: Nardo, 1864:1421.
Eremonia elongata: Gray, 1873:408.
Thalassiochelys tarapacona: Philippi, 1887:85. See Remarks and Comment.
Caretta caretta: Stejneger, 1904:715. First use of combination.
Thallasochelys cephalo: Barbour and Cole, 1906:148.
Caretta caretta caretta: Mertens and Muller, 1928:23.
Caretta gigas Deraniyagala, 1933:66. Type-locality, unlisted. Holotype, not designated, but a skull (BMNH 1946.1.22.64) and a dry plastron and carapace (BMNH 1947.3.5.76) designated as "types" were deposited in the British Museum (Natural History) by Deraniyagala in 1934 [from Gulf of Mannar, Sri Lanka, see Smith and Smith 1980:307] (not examined by author).
Caretta caretta gigas: Deraniyagala, 1939:164.
Caretta caretta tarapacana: Caldwell, 1962a:24.
Chelonia cabuano: Tamayo, 1962:373. *Ex errore.*
Caretta careta: Tamayo, 1962:373. *Ex errore.*



Map. *Caretta* in the Eastern Hemisphere. Symbols: solid circle, major nesting area; open circle, minor or isolated nesting area; open square, non-nesting record.

• **Content.** Two subspecies, *Caretta caretta caretta* (Linnaeus, 1758) in the Atlantic and *C. c. gigas* Deraniyagala, 1933, in the Pacific and Indian oceans, are recognized by some authors, but differentiating characters do not appear to be valid, and, pending further study, subspecies should not be recognized (see Comment).

• **Definition.** A medium to large turtle adapted to a marine existence. Carapace lengths of mature females range from 70-90 cm to 147 cm, depending on the population. Loggerheads are defined by the following suite of characters: two pairs of prefrontal scales; reddish-brown carapace elongate, somewhat tapered posteriorly, and thickened above the caudal region; carapacial scutes not imbricate, except in some young specimens; adult vertebral scutes smooth, although small turtles have a projection toward the rear of each vertebral scute; five pairs of pleurals, the first contacting the cervical scute; usually 3 or 4 inframarginal scutes enlarged and poreless; plastron yellowish-white to yellowish-brown; two claws on each flipper; head very broad and triangular with powerful jaws.

• **Descriptions.** Detailed descriptions are in Deraniyagala (1933, 1934, 1939), Carr (1952), Loveridge and Williams (1957), Brongersma (1972), Ernst and Barbour (1972, 1989), Hughes (1974a), Smith and Smith (1980), and Pritchard and Trebbau (1984). Miller (1985) described developmental stages. Color descriptions of the loggerhead illustrating regional variation are in the following sources: Stebbins (1954), Villiers (1958), Caldwell (1959), Cogger (1983), and Fretey (1986).

• **Illustrations.** Good illustrations are in Deraniyagala (1939), Brongersma (1972), and Pritchard and Trebbau (1984). Photographs illustrating general external morphology and/or color of loggerheads are presented in numerous sources; the following list is abbreviated from Dodd (1988): Carr (1952), Ernst and Barbour (1972), Brongersma (1972), Rebel (1974), Pritchard (1979), Cogger (1983), Pritchard and Trebbau (1984) and Salvador (1985). Miller (1985) gives photographs of developmental stages. The bones of the carapace and plastron are illustrated in Deraniyagala (1939), Zangerl (1980) and Pritchard and Trebbau (1984). The skull is illustrated in Deraniyagala (1939), Romer (1956), Villiers (1958), Ernst and Barbour (1972), Gaffney (1979) and Pritchard and Trebbau (1984).

• **Distribution.** Hundreds of references have reported nesting and non-nesting localities for *Caretta caretta* throughout the world. These have been summarized by Dodd (1988). Loggerheads are circumglobal, inhabiting continental shelves, bays, estuaries, and lagoons in the temperate, subtropical, and tropical waters of the Atlantic, Pacific and Indian oceans. Major nesting grounds are generally located in warm temperate and subtropical regions. Nesting occurs in the tropics, but such nesting is scattered and represents a small fraction of the nesting effort. Foraging areas are largely unknown although at least some temperate zone nesters migrate to tropical waters after the nesting season. In the Americas, loggerheads have been reported as far north as Newfoundland (Squires, 1954) and the state of Washington (Hodge, 1982) and as far south as Argentina (Frazier, 1984) and Chile (Frazier and Salas, 1982). Nesting occurs on the Atlantic coast from the southeastern United States through Brazil, and loggerheads are frequently encountered in shallow waters throughout this area. However, records are scarce from the Pacific coast and nesting apparently does not occur there. Loggerhead hatchlings from the southeastern United States apparently enter drift lines and ride currents to Europe and the Azores and back before taking up subadult developmental habitats (Brongersma, 1972; Carr, 1986, 1987a).

Important nesting reports in the Americas include Carr (1952), Caldwell (1959), Caldwell et al. (1959a,b), Kaufmann (1975), Cardona and de la Rua (1971), Davis and Whiting (1977), Hopkins et al. (1978), Stancyk et al. (1980), Talbert et al. (1980), Andre and West (1981), Carr et al. (1982), Fritts and Hoffman (1982), Hoffman and Fritts (1982), Williams-Walls et al. (1983), Bjorndal et al. (1983), Meylan et al. (1983), Pritchard and Trebbau (1984), Bacon et al. (1984), Shoop et al. (1985), Provancha and Ehrhart (1987), Ehrhart and Raymond (1987), Conley and Hoffman (1987). Non-nesting records include Murphy (1914), Shaw (1946, 1947), Marquez (1969), Abascal (1971), Ferreira de Menezes (1972), Rabalais and Rabalais (1980), Lazell (1980), Lee and Palmer (1981), Frazier and Salas (1982), Mendonca and Ehrhart (1982), Meylan (1983), Reeves and Leatherwood (1983), Fritts et al. (1983), Frazier (1984), Pritchard and Trebbau (1984), Lutcavage and Musick (1985), Carr (1986, 1987a), Schroeder and Thompson (1987).

Outside the Western Hemisphere, loggerheads nest primarily in scattered areas throughout the Mediterranean (Geldiay et al., 1982; Argano and Baldari, 1983), western Africa (Cadenat, 1949), southeastern Africa (Hughes,1974 a,b), Oman (Ross and Barwani, 1982), Japan (Nishimura, 1967; Uchida and Nishiwaki, 1982), and Australia (Bustard, 1972; Limpus, 1982). Scattered nesting may occur elsewhere, as in the Pacific Islands (Pritchard, 1979). Considerable confusion in distinguishing the loggerhead from the olive ridley has led to incorrect reports of occurrence and nesting throughout the Pacific and the western coast of Africa (Loveridge and Williams, 1957; Nishimura, 1967; Frazier, 1985; Dodd, 1988). Non-nesting loggerheads are present on the west coast of Europe (Brongersma, 1972) and the western Indian Ocean, at least as far north as Kenya and the Seychelles, in the Persian and Arabian gulfs and the Gulf of Mannar between India and Sri Lanka, in the East Indies, along the coast of China, all around Australia, and around the islands of the Pacific, including New Zealand. Some of these areas may contain as yet unconfirmed nesting colonies. Dodd (1988) has summarized nesting and non-nesting records and discussed possible cases of misidentification. See the geographic summary in King and Burke (1989) and the map in Dodd (1990) illustrating distribution in the Western Hemisphere.

• **Fossil Record.** Skeletal remains of *Caretta caretta* have been found in Pleistocene deposits at Vero, Indian River County, Florida (Hay, 1917).

• **Pertinent Literature.** Probably more than 1000 good scientific papers deal with the biology of *Caretta caretta*. Dodd (1987) provides a comprehensive bibliography and summarizes the published literature on the loggerhead (Dodd, 1988). Some of the major references are as follows. General external morphology: Deraniyagala (1939), Carr (1952), Loveridge and Williams (1957), Brongersma (1972), Ernst and Barbour (1972, 1989), Hughes (1974a), Smith and Smith (1980), Pritchard and Trebbau (1984). Internal anatomy and bone structure: Sieglbauer (1909), Poglayen-Neuwall (1953), Azzali (1958), Parsons (1968), Walker (1973), Abel and Ellis (1966), Zug (1966), Zangerl (1969, 1980), Albrecht (1976), Gaffney (1979), Rainey (1981), Wolke and George (1981), Rhodin (1985), Zug et al. (1986), Solomon et al. (1986). Morphometric measurements: Deraniyagala (1939), Carr (1952, 1987b), Caldwell (1959, 1962b), Caldwell et al. (1959a), Nishimura (1967), Kaufmann (1975), Hughes (1974a), Brongersma (1972), Davis and Whiting (1977), Ehrhart (1983), Hirth (1980), Stoneburner (1980), Margaritoulis (1982), Mendonça and Ehrhart (1982), Bjorndal et al. (1983), Frazier (1984) and Ehrhart and Witherington (1987). Biochemistry, physiology and genetics: Giral (1955), Frair (1979, 1982), Schoffeniels and Tercafs (1966), Abel and Ellis (1966), Thorson (1968), Susic (1972), Milsom and Johansen (1975), Ackerman (1980, 1981a,b), Smith et al. (1978), Sapsford and Hughes (1978), Sapsford and van der Riet (1979), Lutz et al. (1980), Mrosovsky (1980), Bass and Northcutt (1981), Lutz and Lapennas (1982), Lapennas and Lutz (1982), Frair and Shah (1982), Pearson et al. (1983), Yamauchi et al. (1984), Spotila and Standora (1985), Friedman et al. (1985), Lutz and Bentley (1985), Bjorndal (1985), Prange (1985), Wellins (1987), Dial (1987), Lutz and Dunbar-Cooper (1987), Weldon and Tanner (1990). Developmental biology: Agassiz (1857), Yntema and Mrosovsky (1980), Miller (1985), Blanck and Sawyer (1981), Pearson et al. (1983). Developmental biochemistry and egg chemistry: Kraemer and Bennett (1981), Miller (1985). Maturation: Uchida (1967), Mendonça (1981), Frazer (1983b), Frazer and Schwartz (1984), Frazer and Ehrhart (1985), Zug et al. (1986). Mating: Caldwell (1959), Fritts et al. (1983), Hughes (1974a), Henwood (1987). Nesting behavior, cycles, and frequency: Carr (1952), Caldwell (1959, 1962b), Caldwell et al. (1959a,b), Bustard (1972, 1979), Kaufmann (1975), Hughes (1976), Davis and Whiting (1977), Talbert et al. (1980), Frazer (1983a), Andre and West (1981), Stoneburner and Richardson (1981), Geldiay et al. (1982), Fritts and Hoffman (1982), Bjorndal et al. (1983), Williams-Walls et al. (1983), Limpus and Reed (1985), Iwamoto et al. (1985), Margaritoulis (1985), Ehrhart and Witherington (1987). Egg description, numbers, incubation times, hatching success: Caldwell (1959), Kaufmann (1975), Hirth (1980), Mrosovsky and Yntema (1980), Yntema and Mrosovsky (1982), Ehrhart (1982), Miller (1985), Mrosovsky et al. (1984), Frazer and Richardson (1985 a,b, 1986), Maloney et al. (1990). Hatchling behavior: Fehring (1972), O'Hara (1980),

Kingsmill and Mrosovsky (1982), Mrosovsky and Kingsmill (1985), Davenport and Clough (1986), Salmon and Wyneken (1987). Longevity: Frazer (1983b, 1986). Susceptibility to cold and drowning: Schwartz (1978), Provancha et al. (1986). Parasites and commensals: Ernst and Ernst (1977), Monroe and Limpus (1979), Blair and Limpus (1982), Frazier et al. (1985), Caine (1986). Predators: Stancyk (1982). Feeding and growth: Hughes (1974b), Mendonça (1981), Frazer and Schwartz (1984), Frazer and Ehrhart (1985), Bjorndal (1985), Davenport and Clough (1985), Zug et al. (1986). Migrations and local movements: Hughes (1974b), Carr et al. (1981), Meylan (1982), Limpus (1982), Killingley and Lutcavage (1983), Henwood (1987). Sensory behavior: Grassman and Owens (1982), O'Hara and Wilcox (1990). Population biology: Hughes (1974b), Richardson and Richardson (1982), Frazer (1983 a,b, 1984, 1986, 1987), Henwood (1987), Crouse et al. (1987). Human caused mortality and habitat alteration: Hughes (1974b), Hosier et al. (1981), Ruckdeschel and Zug (1982), Coston-Clements and Hoss (1983), Raymond (1984 a,b), Balazs (1985), Carr (1987b), Ehrhart (1987). Exploitation: Kaufmann (1966), Hughes (1982), Abascal (1971), Rebel (1974). Management: Pritchard (1980), Pritchard et al. (1983), Hopkins and Richardson (1984), Butler et al. (1987).

• **Remarks.** Wallin (1985) argued that inasmuch as Linnaeus' (1758) concept of *Chelonia mydas* included both *Eretmochelys imbricata* and *Caretta caretta* and that surviving type material included both *C. mydas* and *C. caretta*, the Linnaean trivial name *caretta* was not available for *C. caretta* as currently recognized. He stated that the name *caretta* was available in Walbaum (1782), and that the correct citation should be *Caretta caretta* Walbaum, 1782. This interpretation is disputed by Pritchard (pers. comm.) who contends Walbaum was not describing *Caretta* but merely restating Linnaeus' description. The synonymy follows Yañez (1951) and Frazier (1985) in relegating material described as *Thalassiochelys tarapacona* by Philippi (1887) to *Lepidochelys olivacea*. Frazier (1985) provided a synonymy of specimens previously considered *Caretta* from South America which should henceforth be considered synonymous with *Lepidochelys*. King and Burke (1989) note that a 1988 decision by the International Commission of Zoological Nomenclature (Opinion 1463) rejects Lacépède (1788) as a non-binomial publication.

Caretta caretta is listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The loggerhead is listed on Annex II of the Convention on Migratory Species, and as "Vulnerable" in the Red Data Book of the I.U.C.N. (Groombridge, 1982). It is listed as a threatened species under the U.S. Endangered Species Act of 1973, as amended. Regulatory measures for many of the nations in the west-central Atlantic region are summarized by Bacon et al. (1984).

• **Etymology.** The name *Caretta* is a latinized version of the French word "caret," meaning turtle, tortoise, or sea turtle (Smith and Smith, 1980). The name caret or carey (Spanish) is usually associated in the vernacular with the hawksbill *(Eretmochelys imbricata)* rather than the loggerhead, and the name transfer probably resulted from Linnaeus' confusion over the identity of these species (see Brongersma, 1961; Wallin, 1985).

• **Comment.** Deraniyagala (1933) described the Indo-Pacific red-brown loggerheads as *C. gigas* to distinguish them from the Atlantic red-brown loggerheads *(C. caretta)* and the olive-brown loggerheads (i.e., ridleys), which he also placed within the genus *Caretta*. The diagnostic characteristics of the Indo-Pacific red-brown species were said to be the higher number of marginal scutes in *C. gigas* (13 as opposed to 12 in *C. caretta*) and the greater variation in the number of neural bones in *C. gigas* (7-12 as opposed to 7-8 in *C. caretta*). Deraniyagala (1939) later declared *gigas* to be a subspecies of *C. caretta* after examining a series of museum specimens from a wide geographic area.

The diagnostic characters used to distinguish *C. c. gigas* from *C. c. caretta* are not valid. Brongersma (1961) showed that the average number of marginals varied only slightly between populations, and Brongersma (1961), Hughes (1974a), and Pritchard and Trebbau (1984) concluded that such slight variation could not justify recognition of the two subspecies. The number of neurals is also polymorphic, but a sufficient sample size has yet to demonstrate that Atlantic *Caretta* have consistently fewer neurals.

Smith and Smith (1980) proposed that the name *Thalassiochelys tarapacona*, used to describe a new species of loggerhead on the Pacific Coast of South America by Philippi (1887), had priority over the name *C. c. gigas*. They relegated *gigas* to a junior synonym, and misspelled Philippi's name while designating the new subspecies, *C. c. tarapacana* (also see Frazier, 1985). They distinguished the Indo-Pacific subspecies by a suite of characters, including vertebrals II and III relatively broad, supracaudals never longer than wide, plastron much lighter than carapace in young, carapace indented dorsal to hindlimbs, lateral keel over all the costals, neck light with a dark vertebral streak, usually three or more pleurals in contact mesially, usually nine or more neurals, peripherals III not contacted by a rib, and larger adults than *C. c. caretta*. Pritchard and Trebbau (1984) noted that none of these characters has been confirmed and no basis exists for considering the Indo-Pacific loggerheads to be larger than Atlantic loggerheads. In addition, Yañez (1951) and Frazier (1985) have demonstrated that Philippi's (1887) description was based on misidentified specimens of *Lepidochelys olivacea*. Hence the name *Thalassiochelys tarapacana* is a synonym of *L. olivacea* and thus unavailable for the Indo-Pacific redbrown loggerhead. Dodd (1988) discussed the subspecific question in greater detail and concluded that the taxon should not be split into subspecies until substantive supporting data from throughout the species' range are presented.

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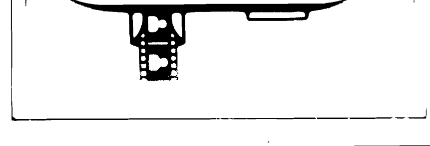
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